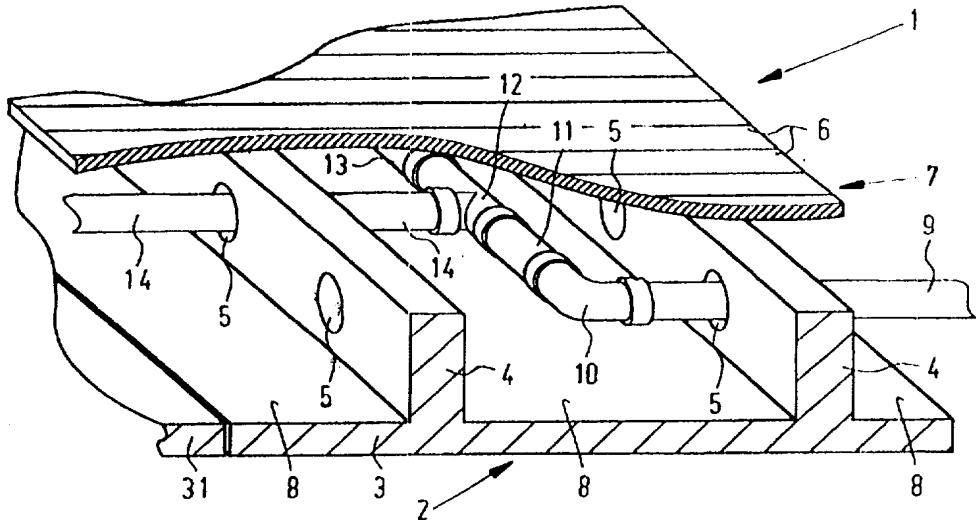


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<p>(21) International Application Number: PCT/NL97/00530</p> <p>(22) International Filing Date: 23 September 1997 (23.09.97)</p> <p>(30) Priority Data:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">1004128</td> <td style="width: 40%;">27 September 1996 (27.09.96)</td> <td style="width: 30%;">NL</td> </tr> <tr> <td>1006073</td> <td>16 May 1997 (16.05.97)</td> <td>NL</td> </tr> </table> <p>(71) Applicant (for all designated States except US): KOOLEN & LICHTENBERG DEVELOPMENT INTERESTS B.V. [NL/NL]; Godswaersingel 87, NL-6041 GK Roermond (NL).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): PRONK, Arie, Dirk, Cornelis [NL/NL]; Maria Gouweloospoort 24, NL-2611 JN Delft (NL). LICHTENBERG, Josephus, Joannes, Norbertus [NL/NL]; Elzenlaan 4, NL-6077 CV St. Odiliënberg (NL).</p> <p>(74) Agent: VAN KAN, J., J., H.; Algemeen Octrooibureau, World Trade Center, Past. Petersstraat 160, NL-5612 LV Eindhoven (NL).</p>		1004128	27 September 1996 (27.09.96)	NL	1006073	16 May 1997 (16.05.97)	NL	<p>(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report. In English translation (filed in Dutch).</p>
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<p>(54) Title: AN ASSEMBLY COMPRISING A PLATE-SHAPED FLOOR MEMBER, AN ASSEMBLY COMPRISING AT LEAST TWO SPACED-APART SECTIONS AND AT LEAST ONE FLOOR MEMBER EXTENDING BETWEEN SAID SECTIONS, AS WELL AS A FLOOR MEMBER AND A SECTION SUITABLE FOR SUCH ASSEMBLIES</p>								
								
<p>(57) Abstract</p> <p>An assembly comprising a plate-shaped floor member (2) provided with a plate (3) and at least two ribs (4) between which a trench (8) is present. At least one rib bounding the trench is provided with at least one passage (5), which extends from said trench to a side of the rib remote from said trench. The assembly furthermore comprises at least one conduit (9) present in the trench, which conduit extends through said passage. The ribs are present on the upper side of the plate, with a plate-shaped covering (7) being present on or between said ribs on a side remote from said plate.</p>								

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An assembly comprising a plate-shaped floor member, an assembly comprising at least two spaced-apart sections and at least one floor member extending between said sections, as well as a floor member and a section suitable for such assemblies.

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The invention relates to an assembly comprising a plate-shaped floor member provided with a plate and at least two ribs, between which a trench is present, which assembly furthermore comprises at least one conduit present in said trench, whereby at least one rib bounding said trench is provided with at least one passage, which extends from said trench to a side of the rib remote from said trench, whilst said conduit extends through said passage.

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The term floor member used herein is understood to mean a structure functioning as a floor and as a ceiling.

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With a similar assembly known from US Patent US-A-3,546,830 conduits are laid through the passages provided in the ribs. An advantage of such an assembly is the fact that the conduits can be laid in a relatively random manner after the floor member has been placed.

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With the assembly according to US-A-3,546,830 the ribs are present on the underside of the plate, whereby the upper side of the floor member can directly function as a floor of a house on which walking is possible. The underside of the floor member is not finished.

25

A floor member of this kind is not suitable as a partition floor between two spaces lying one above the other, whereby the floor member functions as a ceiling in one space and as a floor in the space present above said space. In the first place the conduits are exposed to view from the lower space. Secondly the conduits must be mounted against the ceiling, which is relatively labourious. Thirdly a sewage conduit associated with the upper space, for example, extends under the floor of said upper space, against the ceiling of the lower space, whereby the conduit is only accessible from said lower space. Because of this arrangement the user of the upper space is dependent on the user of the lower space for gaining access to the conduit, for example in the event of maintenance of defects, which is undesirable.

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The object of the invention is to provide an assembly wherein the conduit can be provided in a relatively simple manner and wherein the conduit is accessible from the space with which the conduit

is associated.

This objective is accomplished with the assembly according to the invention in that said ribs are present on the upper side of the plate, with a plate-shaped covering being present on or between
5 said ribs on a side remote from said plate.

The conduit can be placed in the trench in a simple manner and be supported by the plate. The conduit is subsequently hidden from view by the covering and a floor is obtained on which walking is possible. If the conduit is to be replaced, the covering is removed and
10 access to the conduit is gained.

The passages in the ribs make it possible for the conduit to extend not only parallel to the trench, but also through the ribs bounding said trench, and to reach a substantially random position on the plate. Furthermore it is possible to have the conduits extend
15 transversely to the ribs, from one floor member to another floor member, when several floor members are arranged in side-by-side relationship, wherein the ribs of the various floor members extend parallel to each other. Thus a practically unlimited number of possible positions of the conduit are possible.

In addition to that the underside of the floor member does not require any additional finishing with the assembly according to the invention.

The invention also relates to an assembly comprising at least two spaced-apart sections and at least one floor member extending
25 between said sections.

An assembly known from European patent EP-B1-0 112 598 comprises Z-shaped sections and corrugated floor members. The floor members are supported with their ends on flanges of sections projecting under the floor member. Conduits may be laid in the trenches of said corrugated floor
30 members, which conduits can be replaced in a simple manner and/or be laid in other trenches, for example in the event of a renovation. The conduits cannot extend transversely to the slots, however. The assembly is inter alia used for constructing buildings, such as houses.

One drawback of the known assembly is the fact that
35 both the upper side and the underside of the floor member require finishing if the assembly is used as a partition floor.

Another drawback is the fact that the load-bearing capacity of the corrugated floor member is relatively small, whereas the manufacturing costs are relatively high.

5 The object of the invention is to provide an assembly wherein the above drawbacks are avoided.

This objective is accomplished with the assembly according to the invention in that the floor member is provided with a plate, which comprises on an upper side thereof at least two ribs extending in the longitudinal direction of the plate, which extend beyond edges of
10 the plate with their ends, whereby said ends are supported on said sections.

The ends of the ribs supported on the sections and extending beyond the plate make it possible to have the underside of the plate either terminate at the same height or under the section. The
15 underside of the plate does not require any further finishing with additional panels. The space bounded by the plate and the ribs may be used for laying conduits therein, after which a covering may be provided on the ribs. The conduits present on the plate can be readily removed, rearranged or replaced at a later stage, for example in the event of a
20 renovation, by removing the cover plates. The total thickness of the floor member built up in this manner may be the same or less than that of the known floor member, whilst the load-bearing capacity is considerably higher.

One embodiment of the assembly according to the
25 invention is characterized in that the elongated d-shaped section comprises an elongated duct and a flange being in line with a wall of said duct, whereby the ends of the ribs are supported by said flange.

The d-shaped section is relatively stiff and of simple design. With a section of this kind the underside of the plate may be
30 positioned lower than the underside of the flange, as a result of which the underside of the plate need not be covered, whilst the section can be hidden from view in a relatively simple manner. The finish of the section may be provided in the same plane as the underside of the plate. As a result of this the total thickness of the floor member is relatively
35 limited.

Another embodiment of the assembly according to the invention is characterized in that upright walls of the elongated duct

are provided with aligned passages.

The conduits present on the plate can be passed through said passages. If conduits must be removed at a later stage, for example in case of a renovation, these conduits can be removed from the passages in a simple manner and be passed through other passages already present in the section. The assembly according to the invention makes it possible to provide new conduits in the future or to remove already existing conduits in a relatively simple manner. This is important in particular in order to leave open the possibility of future adaptation of buildings to demands that may apply in the future. It is noted that with the assembly known from EP-B1-0 112 598 only a limited number of trenches are connected to trenches in the wall, as a result of which conduits can only be laid in those trenches. With the assembly according to the invention conduits can be laid over the entire plate surface.

The invention will be explained in more detail with reference to the drawings, in which:

Figure 1 is a perspective view of a first embodiment of an assembly according to the invention;

Figure 2 is a cross-sectional view of the assembly shown in Figure 1;

Figure 3 is a cross-sectional view of a second embodiment of an assembly according to the invention;

Figure 4 is a cross-sectional view of a third embodiment of an assembly according to the invention;

Figure 5 is a cross-sectional view of a fourth embodiment of an assembly according to the invention;

Figure 6 is a cross-sectional view of a fifth embodiment of an assembly according to the invention;

Figure 7 is a perspective view of a floor member according to the invention;

Figure 8 is a perspective view of an assembly according to the invention;

Figure 9 is a perspective view of another finished assembly according to the invention;

Figure 10 is a perspective view of yet another finished assembly according to the invention;

Figure 11 is a perspective view of yet another finished assembly according to the invention;

Figure 12 is a cross-sectional view in Y-direction of an assembly according to the invention;

5 Figure 13 is another cross-sectional view in Y-direction of an assembly according to the invention;

Figure 14 is a cross-sectional view in X-direction of an assembly according to the invention;

10 Figure 15 is a perspective view of a detail of the assembly shown in Figure 9;

Figure 16 is cross-sectional view in X-direction of an assembly according to the invention;

Figure 17 is another cross-sectional view in X-direction of an assembly according to the invention;

15 Figures 18A-B are cross-sectional views in Y-direction of the structure shown in Figure 9.

Like parts are numbered alike in the Figures.

20 Figures 1 and 2 are a perspective view and a cross-sectional view respectively of a first embodiment of an assembly 1 according to the invention. Assembly 1 comprises a number of floor members 2 arranged in side-by-side relationship, which are each provided with a plate 3 and with two ribs 4 extending parallel to each other. Ribs 4 are each provided with a number of passages 5 lying side by side. Assembly 1 furthermore comprises a plate-shaped covering 7 built up of wooden slats 25 6, which is present on a side of ribs 4 remote from plate 3. Plates 3, ribs 4 and the covering 7 present thereon bound elongated trenches 8. Also with two plates 3, 3' lying side by side, plates 3, 3' and the ribs 4 of plates 3, 3' positioned near each other bound, together with covering 7, a channel-shaped trench 8. Conduits 9 are provided in channel-shaped 30 trenches 8 before placing covering 7 on ribs 4, which conduits may simply extend parallel to ribs 4. It is also possible, however, to have conduit 9 extend transversely to ribs 4 via passages 5. In the assembly shown in Figure 1, conduit 9 comprises a first conduit portion 10, which extends through a passage 5 of right-hand rib 4, a second conduit portion 11, which 35 extends transversely to first conduit portion 10 and which is present in trench 8 between ribs 4. Second conduit portion 11 is connected, by means of a T-shaped coupling piece 12, to a third conduit portion 13, which

extends in line with second conduit portion 11, and to a fourth conduit portion 14, which extends transversely to conduit portions 11, 13 into a trench 8 to the left of left-hand rib 4.

Assembly 1 is put together in the following manner.

5 In order to obtain a wall or a ceiling a number of plates 3 are positioned side by side, whereby ends of plates 3 are supported by supporting sections (not shown). Then conduits 9 are provided in trenches 8 and through passages 5, whereby the lay-out of the conduits is selected in dependence on the desired location of inter alia the beginning and the end of conduit
10 9. The conduits may comprise sewers, computer cables, alarm facilities, air ducts, water pipes, gas pipes, electric conduits, optical cables, community antenna cables, etc. After the desired conduits 9 have been provided on plates 3, covering 7 is mounted on the side of ribs 4 remote from plate 3, as a result of which conduits 9 are hidden from view. Thus
15 a floor fitted with conduits can be provided in a relatively simple manner. When conduits 9 must be accessed for maintenance work or renovation, covering 7 is removed, after which conduit 9 is readily accessible. In this way it is also possible to rearrange or remove the existing conduits 9 in case of a renovation or to replace them by new conduits, which can
20 be placed over the floor members 2 lying side by side in a different manner, or to add additional conduits.

With the assembly 1 shown in Figures 1 and 2 covering 7 forms a floor, whilst the side of plate 3 remote from covering 7 forms a ceiling of a space present under plate 3.

25 Figure 3 shows a second embodiment of an assembly 21 according to the invention, which comprises a plate 22 and ribs 23, 24 extending transversely to said plate, on either side thereof. All ribs 23, 24 are provided with passages 5 extending transversely to ribs 23, 24. Assembly 21 comprises plate-shaped coverings 25 and 26 respectively
30 on the sides of ribs 23, 24 remote from plate 22. Covering 25 forms a floor of a space above covering 25, whilst covering 26 forms a ceiling of a space under covering 26. In this manner conduits can be provided both in the ceiling and in the floor of a space and be replaced in a simple manner in case of a renovation. It is possible to provide the plate with passages
35 extending transversely to the plate, as a result of which the conduits can be passed through the plate, thus providing a connection between the upper side and the bottom side of said plate.

Figure 4 shows a third embodiment of an assembly 30 according to the invention, which largely corresponds with the assembly 21 according to the invention illustrated in Figure 3. The difference with the assembly 21 shown in Figure 3 is that instead of a covering 26 which
5 abuts against ends of ribs 24 remote from plate 22, a number of plate-shaped coverings 31 are provided, which each extend between ribs 24 and which abut with long sides 32 against long sides 33 of ribs 24. In this manner a single covering 31 can be removed in a relatively simple manner. A possible drawback of a covering 31 of this type is that the joints
10 between ribs 24 and covering 31 are exposed to view.

Figure 5 shows a fourth embodiment 35 according to the invention, which comprises a plate 36 and ribs 37 extending transversely thereto, which ribs comprise a widened portion 38 on a side remote from plate 36 and a plate-shaped covering 39 supported by widened portion 38.
15 The presence of widened portions 38 makes it possible to make covering 39 relatively thin, whilst the required strength of covering 39 is still ensured.

Figure 6 shows a fifth embodiment of an assembly 40 according to the invention, which is provided with a floor member 41, which
20 comprises a plate 42 and ribs 43 extending transversely to plate 42. Plate 42 is provided with relatively thin channels 44 extending transversely to the plate. Each rib 43 is provided with a widened portion 45, which is located near plate 42, and a narrower portion 46, which is recessed with respect to said widened portion. Assembly 40 is furthermore provided
25 with a layer of sound-absorbing insulation material 47, which is present on plate 42 and between widened portions 45, and with intermediate plates 48 lying on top of said layer. Said intermediate plates extend parallel to ribs 43 and are supported near ribs 43 by supporting flanges 49, which are present on a side of widened portion 45 remote from plate 42, and which
30 are furthermore bounded by narrower portion 46. A plate-shaped covering 50 is provided on a side of the narrower portions 46 of ribs 43 remote from plate 42. Intermediate plates 48, narrower portions 46 of ribs 43 and covering 50 bound channel-shaped trenches 51, in which conduits 9 are present. Conduits 9 furthermore extend through passages 5 present in the
35 narrower portions 46 between intermediate plates 48 and covering 50. The advantage of assembly 40 according to the invention is that conduits 9 can be provided and replaced in a simple manner. Another advantage of

assembly 40 according to the invention is that it has relatively good sound-absorbing qualities as a result of the presence of channels 44 and the insulating layer 47 present above said channels.

5 Figure 7 shows a floor member 101 according to the invention, which comprises an elongated concrete plate 102, which is provided near long sides with ribs 103 formed in one piece with said plate, which extend with ends 104 beyond edges 105 of plate 102. Near edge 105 an underside 106 of each rib 103 is spaced from the underside 107 of plate 102 by a distance H. A stiffening rib 108 formed in one piece with plate 102 extends between ribs 103, near edge 105. Both ribs 103 and stiffening rib 108 have a trapezoidal cross-section 109. Ribs 103 are spaced from the long sides of the plate by a distance A. The Figure shows a system of axes X, Y, Z, which will also be used in the other Figures to explain the various views. The X-direction indicates the longitudinal direction of the plate, the Y-direction indicates the transverse direction of the plate, and the Z-direction indicates the vertical direction.

Figure 8 shows a skeleton of a building under construction, of which a steel structure 110 has already been built up. Steel structure 110 comprises a number of steel columns 111 extending in Z-direction, which are interconnected by sections 112, 113 in Y-direction and by U-shaped and I-shaped sections 114, 115 in X-direction. Each plane formed by columns 111 and sections 114 is furthermore stiffened by means of stability connections (stiffening crosses). These sides form part of the partition walls or the side walls of the building. The front and rear sides of the building are made up of the planes formed by columns 111 and sections 112. At its front side the building comprises a steel structure 117, in which windows and doors may be provided. This structure does not form part of the invention and consequently will not be explained in more detail herein. Sections 112, 113 extend between two columns 111, whereby sections 112, 113 are mounted on either side of columns 111. As a result of this arrangement sections 112, 113 are spaced apart, so that a through opening 118 extends between sections 112, 113. Sections 112 are provided with passages 119, with passages 119 of sections located adjacently to each other being in line. Each section 112 is furthermore provided with flanges 120 extending in the longitudinal direction of section 112. The flanges 120 of opposed sections 112 are directed to each other, whereby flanges 120 function to support the ends 104 of floor members 101. This

will be explained in more detail with reference to Figure 9. The steel structure 110 is furthermore provided with a number of trimming joints 121, which are used for mounting a staircase.

Figure 9 is a perspective rear view of the structure 110 shown in Figure 8, which shows concrete floor members 101, which have been placed on flanges 120 of sections 112. Following that conduits 122 were provided, which conduits 122 are present on plate 102 between ribs 103, and which were subsequently passed into the openings 118 bounded by sections 112, 113 through the passages 119 in sections 112. Conduits 122, for example conduits used for telecommunication, heating, cooling, air conditioning, community antenna, gas, water, electric, data, sewage, can be laid as desired through the entire the steel structure. In principle all places in the steel structure are accessible via passages 119, openings 118 and the trenches formed by plates 102 and ribs 103, as it were.

Figure 10 shows an enlarged detail of the structure shown in Figure 9, wherein wooden slats 123 are placed transversely to ribs 103, which slats function to support cover plates 124 (see Figure 11). If the lay-out of the conduits 122 is to be changed at a later stage, for example in case of a renovation, plates 124 and 123 are removed locally, after which conduits 122 will be accessible again.

Figure 11 shows a structure 125 which is comparable with the structure 110 shown in Figure 8, wherein wooden plates 124 are placed on wooden slats 123.

Figures 12, 13, 14 show details of structure 125, wherein structure 125 is furthermore provided with upright walls and further additions have been made.

Figure 12 is a sectional view of structure 125 as indicated by arrow VI-VI. Connected to column 111, in a manner known per se, is one end of d-shaped section 112. D-shaped section 112 comprises a bottom wall 126 and a flange 120 connected thereto, which is in line therewith. Connected to bottom wall 126 are two upright side walls 127, which are each provided with passages 119. Side walls 127 are interconnected by an upper wall 128 on a side remote from bottom wall 126. Flange 120 supports the ends 104 of a concrete floor member 101. The space between stiffening rib 108 and side wall 127 of section 112 is filled with insulation material 129. Floor portion 101 functions both as a support for slats 123 and the plates 124 forming a floor and as a ceiling for the

space under floor member 101. As can be seen in Figure 12, the underside 130 of plate 102 is positioned under flange 120. The space between flange 120 and the level of the underside 130 of plate 102 is filled with insulation material 131. The side 132 of the insulation material 131 that is exposed to view may be finished in the same manner as the underside 130 of plate 102. In order to provide an adequate sound insulation felt 133 is provided between ribs 103 and wooden slats 123, as well as between the upper wall 128 of section 112 and the wooden plates 124. Walls 134, 135 are placed on either side of the steel structure 117. Each wall 135 is supported on the wooden plates 124 with an underside. Each wall 135 is provided with a tubular passage 136 near the underside, which passage is closed on a side remote from structure 117 by a removable skirting-board 137. Passage 136 may be used for accommodating electric conduits therein.

Figure 13 is a cross-sectional view in the direction indicated by arrows VII-VII of the structure 125 shown in Figure 11. In the situation shown in Figure 13 two d-shaped sections 112 are mounted on either side of a column 111. Conduits 122 are present on floor members 101, which conduits extend through passages 119 in sections 112 to the space 118 present between sections 112, from where conduit 122 is led to another place in structure 125.

Figure 14 is a cross-sectional view in the direction indicated by arrows VIII-VIII of the structure 125 shown in Figure 11. The cross-sectional view of Figure 14 shows a situation wherein two structures 125 lie side by side. Consequently the right-hand part of arrow VIII is illustrated in dotted lines in Figure 11. When a number of connected houses are constructed, a number of structures 125 are placed in abutting relationship, whereby two columns 111 are arranged near each other, and two stiffening crosses 116 are arranged opposite each other at every transition from one structure 125 to the other structure 125. In the cross-sectional view of Figure 14 two U-shaped sections 114 of the two structures 125 lying side by side extend along each other. Floor members 101 extend parallel to sections 114. Plates 102 extend toward each other under sections 114, with portions 138 extending beyond ribs near the outer edge of plates 102. A layer of felt 139 is provided between portions 138. Insulation material 140 is provided between the parallel walls 135 of the two houses. As can be seen in Figure 14, slats 123 are supported with their ends on ribs 103, whereby felt is provided between

ribs 103 and slats 123. Short slats 141 extend between slats 123.

Figure 15 is a perspective view of a part of the structure shown in Figure 9, showing an opening 142 for a staircase. A trimming joint 121 is provided near opening 142, which trimming joint
5 comprises an upright wall 143, a plate 144 forming a flange, which extends transversely thereto, sloping connecting surfaces 145 connected to wall 143 and plate 144, and suspension supports 146, 147 connected to connecting surfaces 145. Suspension support 146 is plate-shaped and is supported by I-shaped section 115. Suspension support 147 comprises a plate portion
10 148, which is supported on rib 103, and a plate-shaped portion 149 connected perpendicularly thereto, which engages round rib 103. Floor member 101 is supported with its ends 104 on flange-shaped plate 144 of trimming joint 121.

Figure 16 is a cross-sectional view of two structures
15 125 placed in abutting relationship, wherein the portion on the left-hand side corresponds with the left-hand portion of Figure 14. On the right-hand side a finishing plate 150 of trimming joint 121 can be seen.

Figure 17 is another cross-sectional view of the structure shown in Figure 15, in a direction indicated by arrow XI-XI.
20 The floor member 101 shown on the right-hand side abuts against I-shaped section 115 with one end 138, whereby felt 139 is provided between floor member 101 and section 115.

Figure 18A is a cross-sectional view of the structure shown in Figure 15 in a direction indicated by arrow XII-XII. Figure 18A
25 clearly shows that trimming joint 121 is supported on I-shaped section 121 with suspension support 146 on the left-hand side, whilst it hooks behind a rib 103 of a floor member 101 positioned to the right of trimming joint 121 with plate portions 148, 149.

Figure 18B is a cross-sectional view of a finished
30 staircase trimming joint 121 and a floor member positioned beside said trimming joint.

With the assembly according to the invention the use of floor member 101 and sections 112 makes it possible to provide conduits in a building and change the lay-out of the conduits at a later stage in
35 a simple manner. The construction of floor member 101, with projecting parts 104 being supported on flanges 120 of sections 112, prevents flanges 120 from extending under floor members 101. As a result of this

construction of floor member 101 the height of the total floor structure is relatively small, whilst floor member 101 is sufficiently stiff and strong.

5 It is also possible to make plate 102 of concrete, for example, whilst ribs 103 are made of steel and said ribs are anchored in the concrete plate.

It is also possible to leave out stiffening rib 108.

10 The passages may extend obliquely through ribs 4 rather than transversely thereto. Furthermore a number of passage 5 may be positioned one above the other, so that electric conduits for low-voltage current and high-voltage current, for example, can be kept spaced apart.

15 The plate and the ribs attached thereto may be made of a homogeneous material, such as concrete, or of a combination of materials wherein the plate is for example made of concrete, plaster board, multi-ply board, particled board or metal, and the ribs are made of reinforced concrete, hot-rolled steel sections, cold-formed steel, other metals, wood and the like.

If plate 3 is exposed to view, plate 3 may be provided with a finishing layer.

20 The covering may also be made of a plate-shaped material rather than of slats.

25 Preferably the plate is made of concrete and the ribs attached thereto are made of concrete or of steel, and the ribs are only present on the upper side of the plate. The advantage of a floor member of this type is that it is relatively simple and inexpensive to produce, whereby an underside of the plate forming a ceiling directly has a finished appearance. When the conduits are being provided, they can be simply laid between the ribs on the plate and subsequently be interconnected. The plate-shaped covering which is subsequently placed on the ribs can be
30 finished by means known per se, such as carpeting, parquet, etc. If the ribs are present on the underside of the plate, both the upper side and the underside usually require finishing.

CLAIMS

1. An assembly comprising a plate-shaped floor member provided with a plate and at least two ribs, between which a trench is present, which assembly furthermore comprises at least one conduit present in said trench, whereby at least one rib bounding said trench is provided with at least one passage, which extends from said trench to a side of the rib remote from said trench, whilst said conduit extends through said passage, characterized in that said ribs are present on the upper side of the plate, with a plate-shaped covering being present on or between said ribs on a side remote from said plate.

2. An assembly according to claim 1, characterized in that said plate-shaped covering is detachable.

3. An assembly according to claim 1 or 2, characterized in that each rib is provided with a number of spaced-apart passages.

4. An assembly according to any one of the preceding claims, characterized in that said plate is furthermore provided on the underside with two parallel ribs, which are provided with passages.

5. An assembly according to any one of the preceding claims, characterized in that said rib is widened on a side remote from said plate.

6. An assembly according to any one of the preceding claims, characterized in that said ribs are provided with supporting flanges, which are present between said passages and said plate, whereby intermediate plates are present on said supporting flanges.

7. An assembly according to claim 6, characterized in that said plate is perforated.

8. An assembly according to any one of the preceding claims, characterized in that said assembly is provided with at least two spaced-apart sections, which support said floor member, whereby ends of ribs extending beyond edges of said plate are supported on said sections.

9. An assembly comprising at least two spaced-apart sections and at least one floor member extending between said sections, characterized in that said floor member is provided with an elongated plate, which comprises on an upper side thereof at least two ribs extending in the longitudinal direction of the plate, which extend beyond edges of the plate with their ends, whereby said ends are supported on said

sections.

10. An assembly according to claim 8 or 9, characterized in that the elongated d-shaped section comprises an elongated duct and a flange being in line with a wall of said duct, whereby the ends of the ribs are supported by said flange.

11. An assembly according to claim 10, characterized in that upright walls of said elongated duct are provided with aligned passages.

12. An assembly according to any one of the preceding claims 8 - 11, characterized in that aligned floor members are supported with facing edges by spaced-apart, parallel sections.

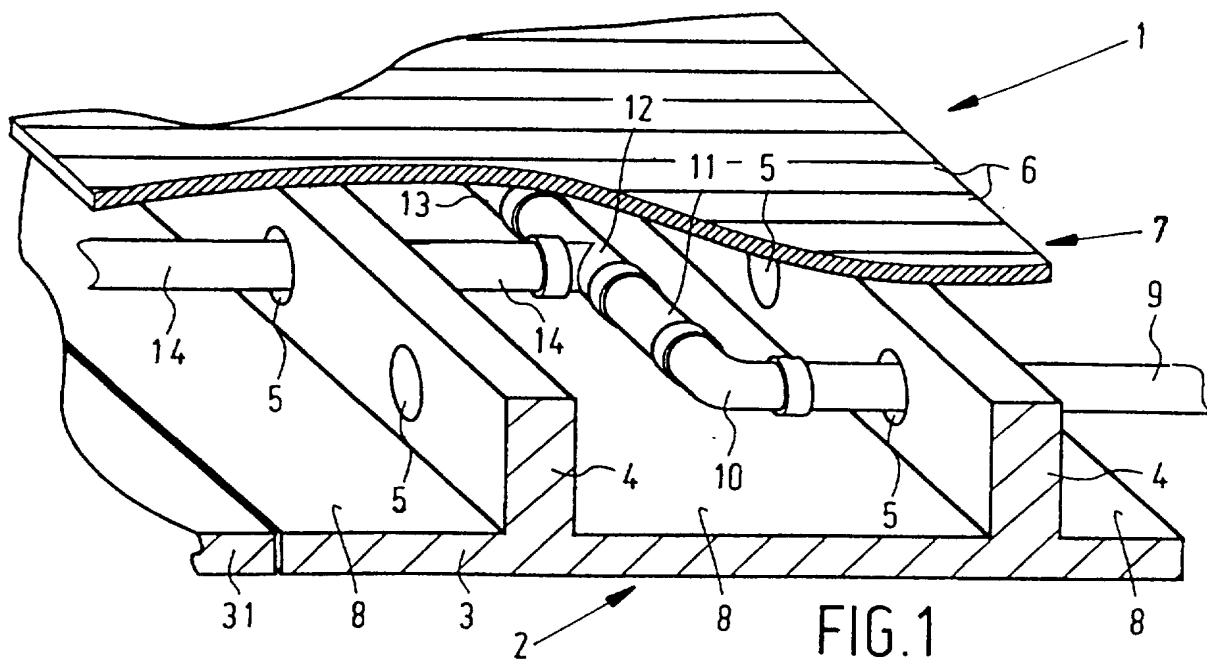
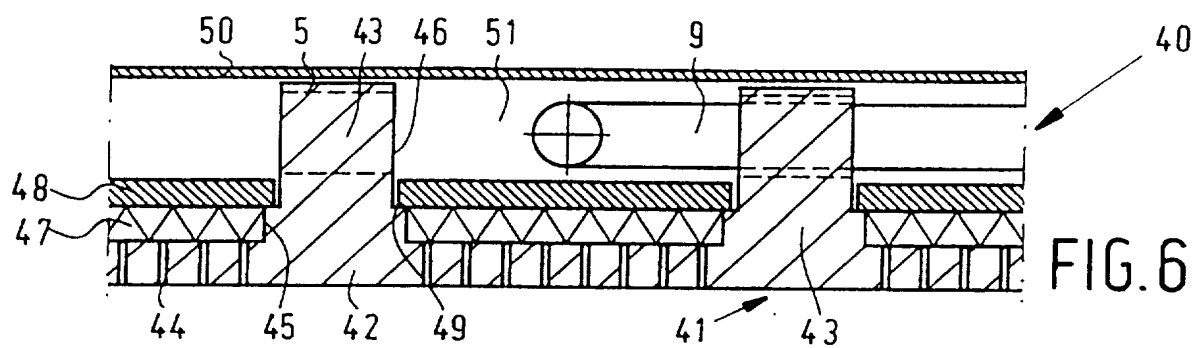
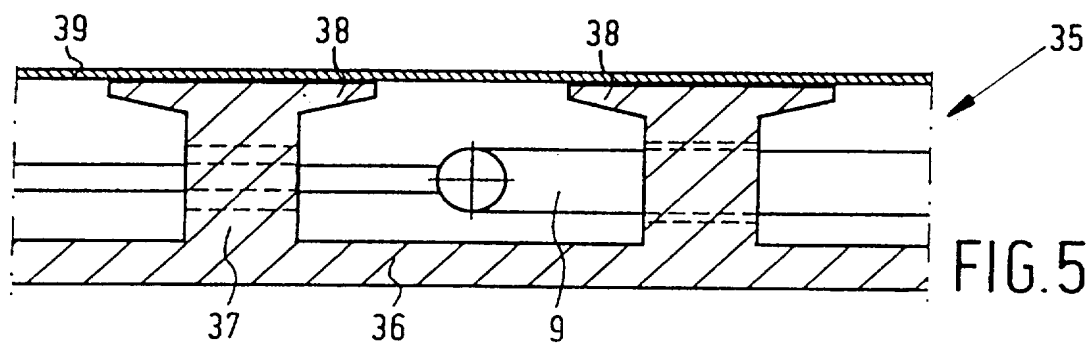
13. An assembly according to any one of the preceding claims 8 - 12, characterized in that conduits are provided between the ribs on said plate, through the passages in the tubular sections, and/or between parallel sections.

14. An assembly according to any one of the preceding claims 8 - 13, characterized in that said plate is provided near its edge with at least one stiffening rib extending between said ribs.

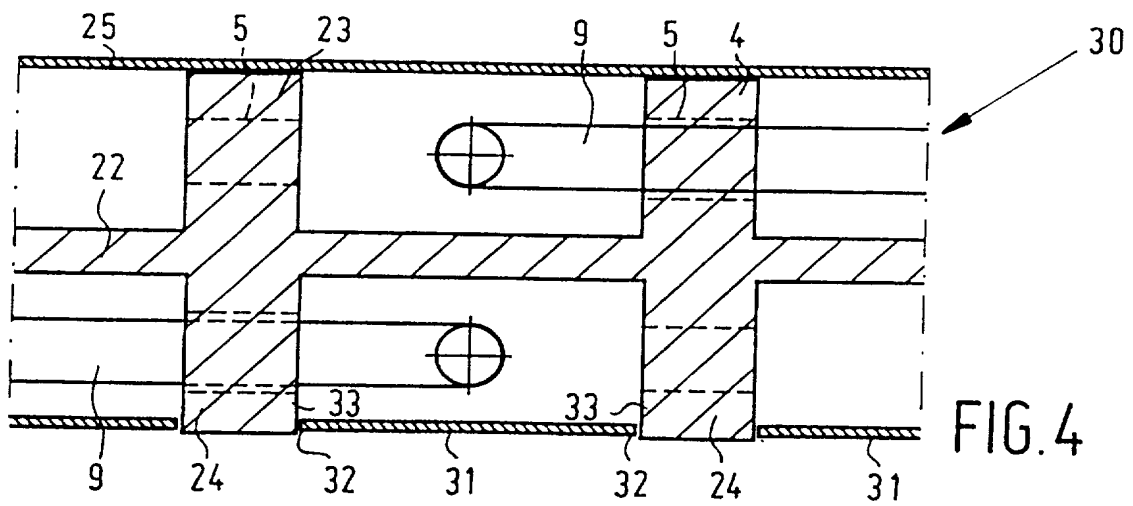
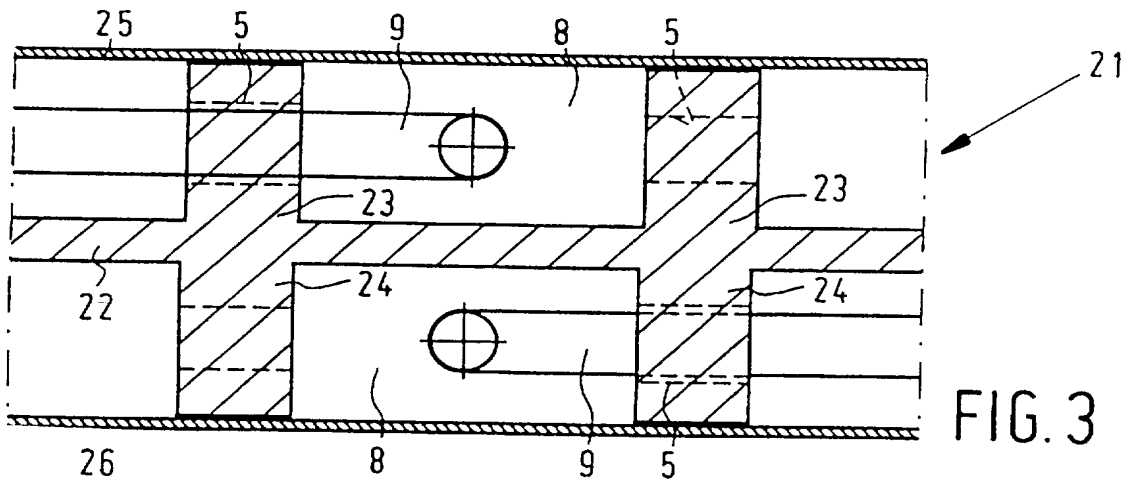
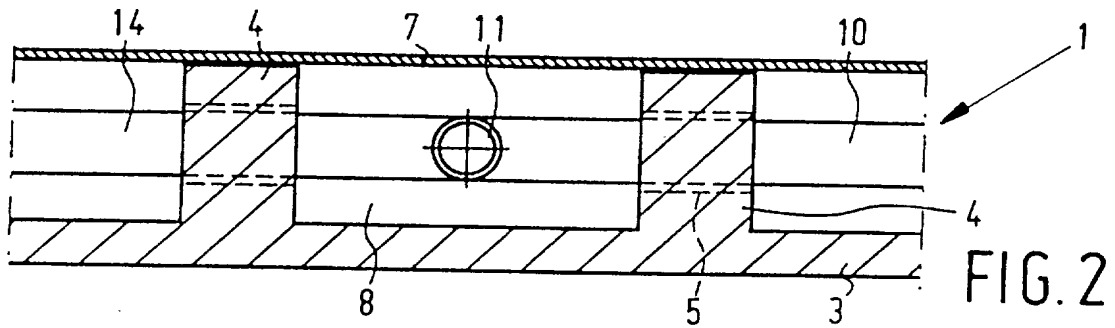
15. A floor member according to any one of the preceding claims.

16. A section according to any one of the preceding claims.

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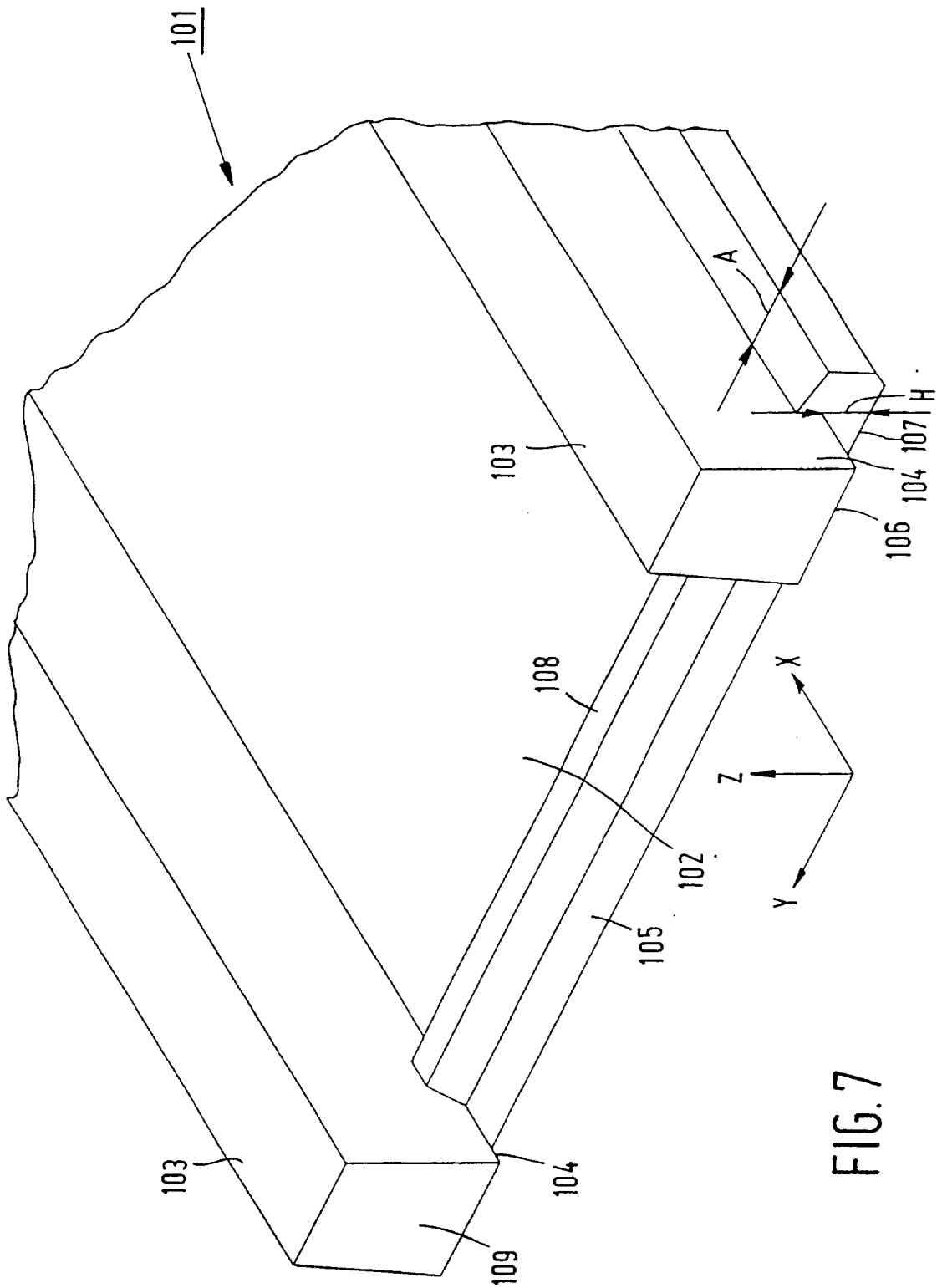
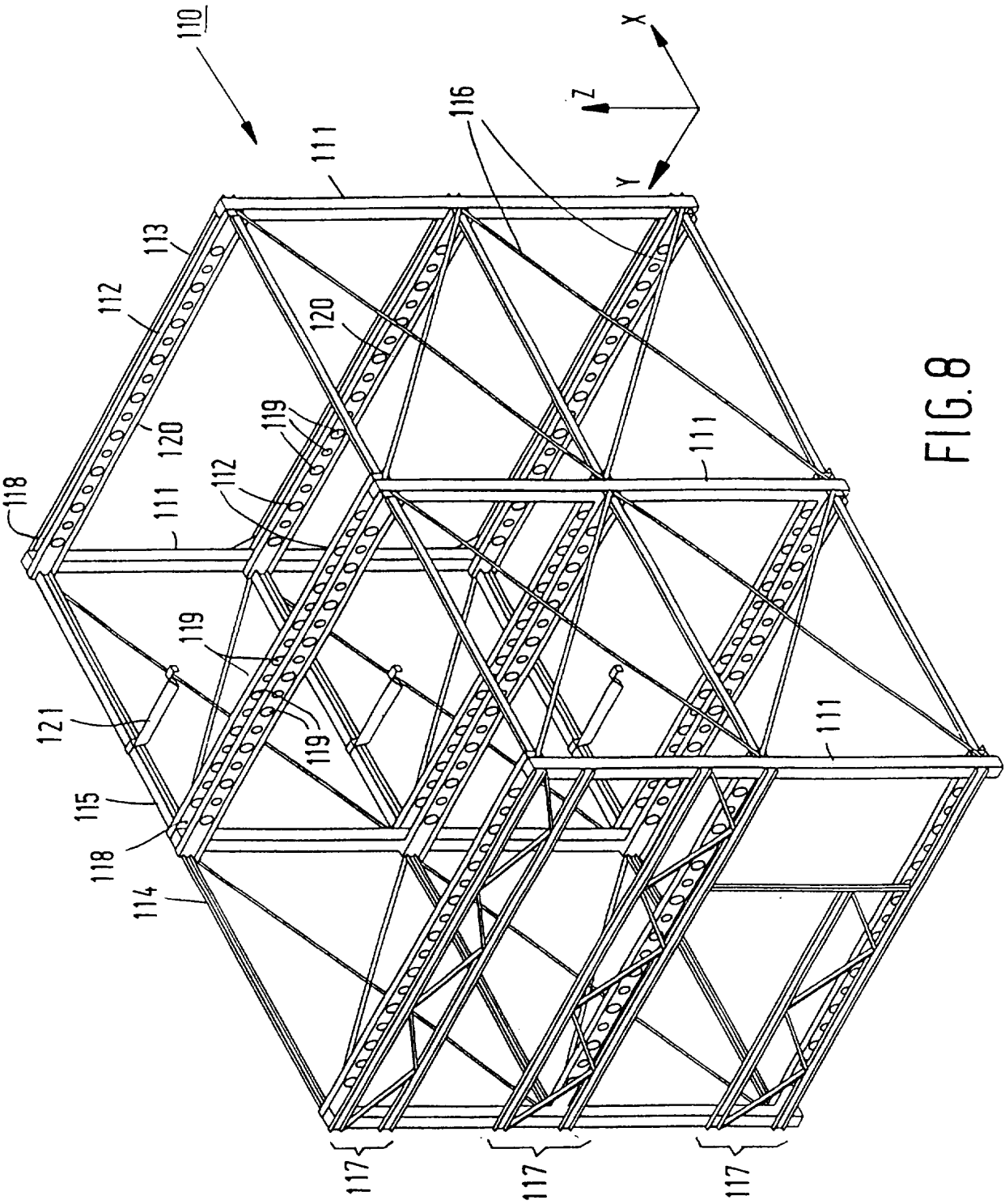
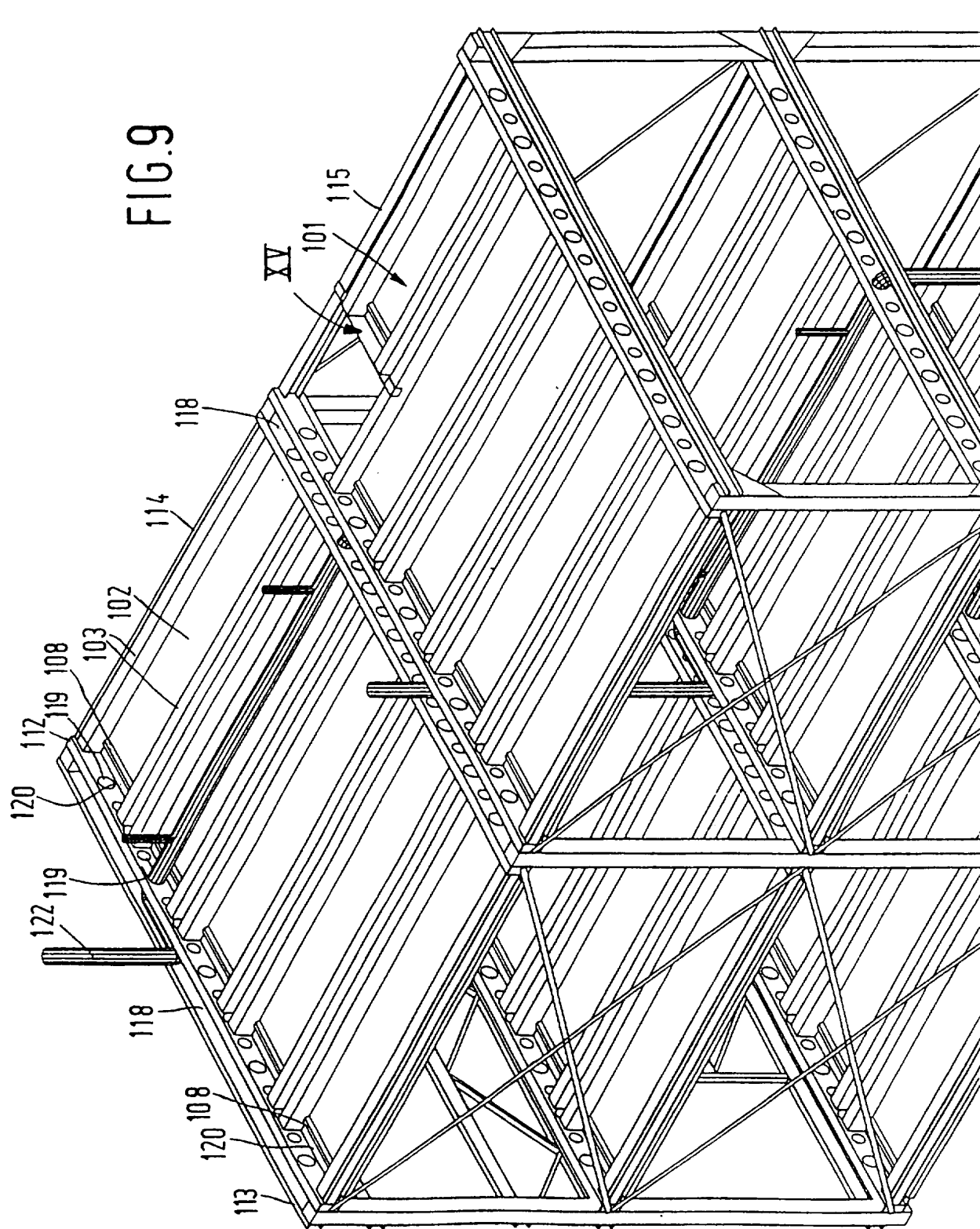


FIG. 7

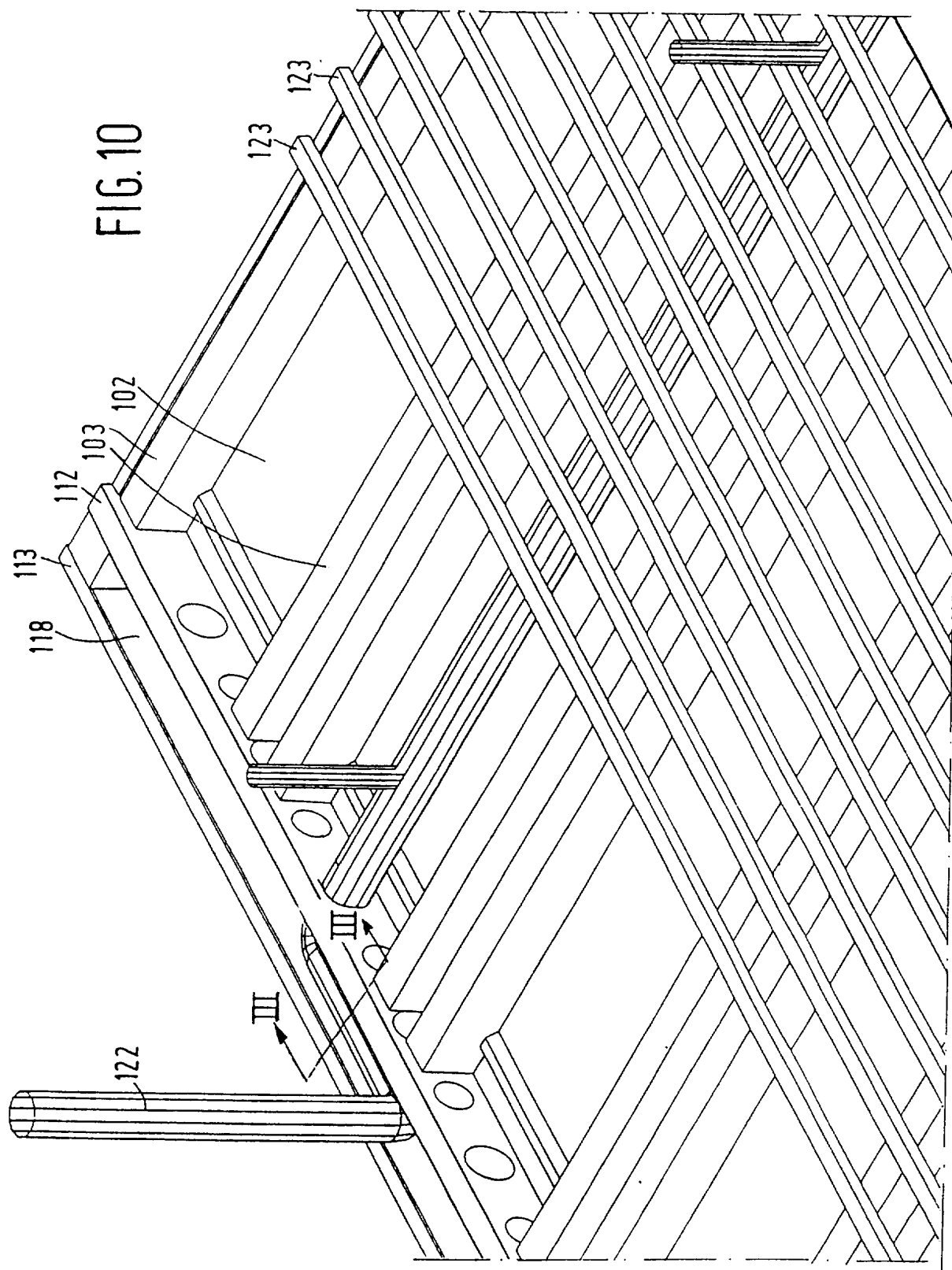


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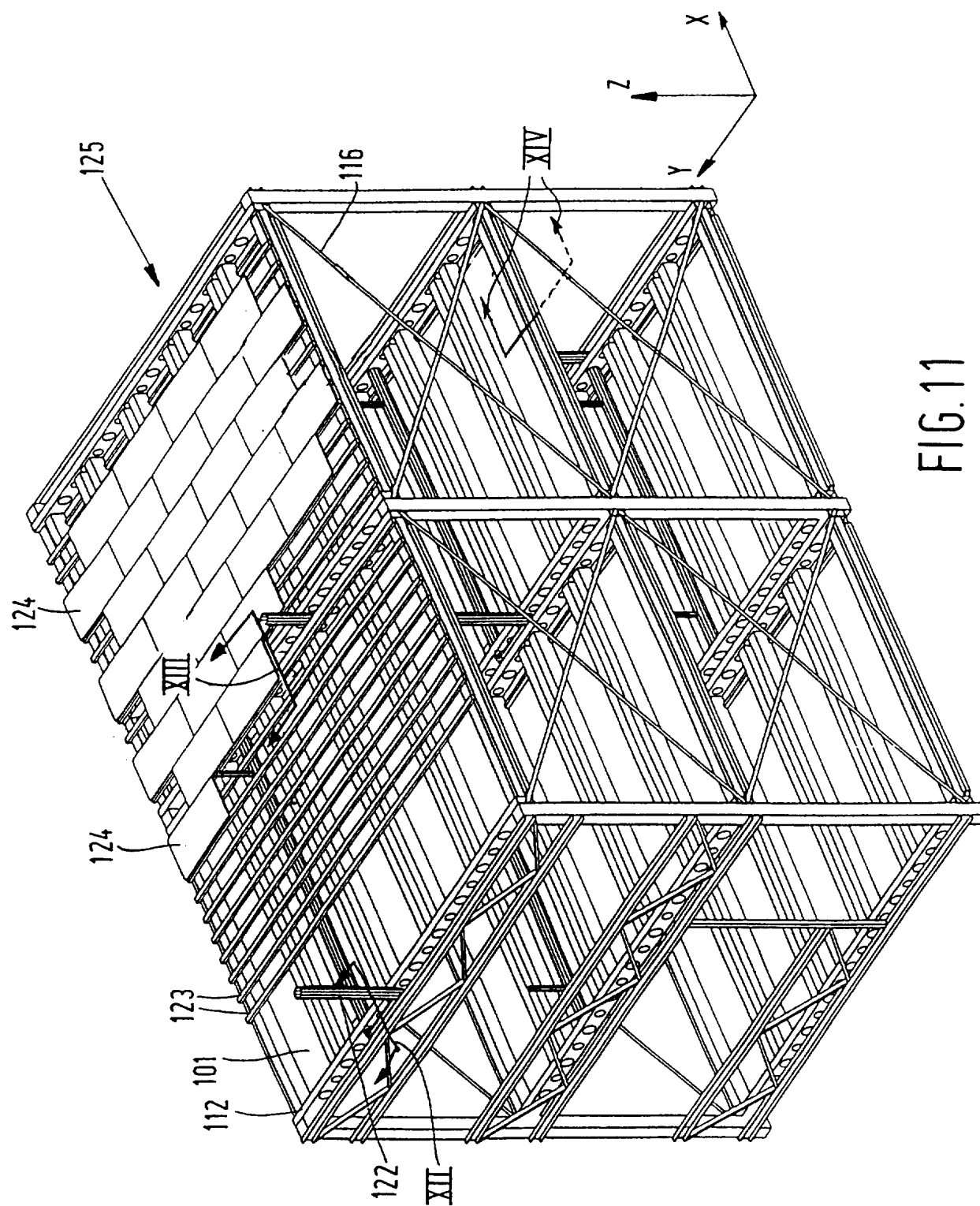
FIG. 9

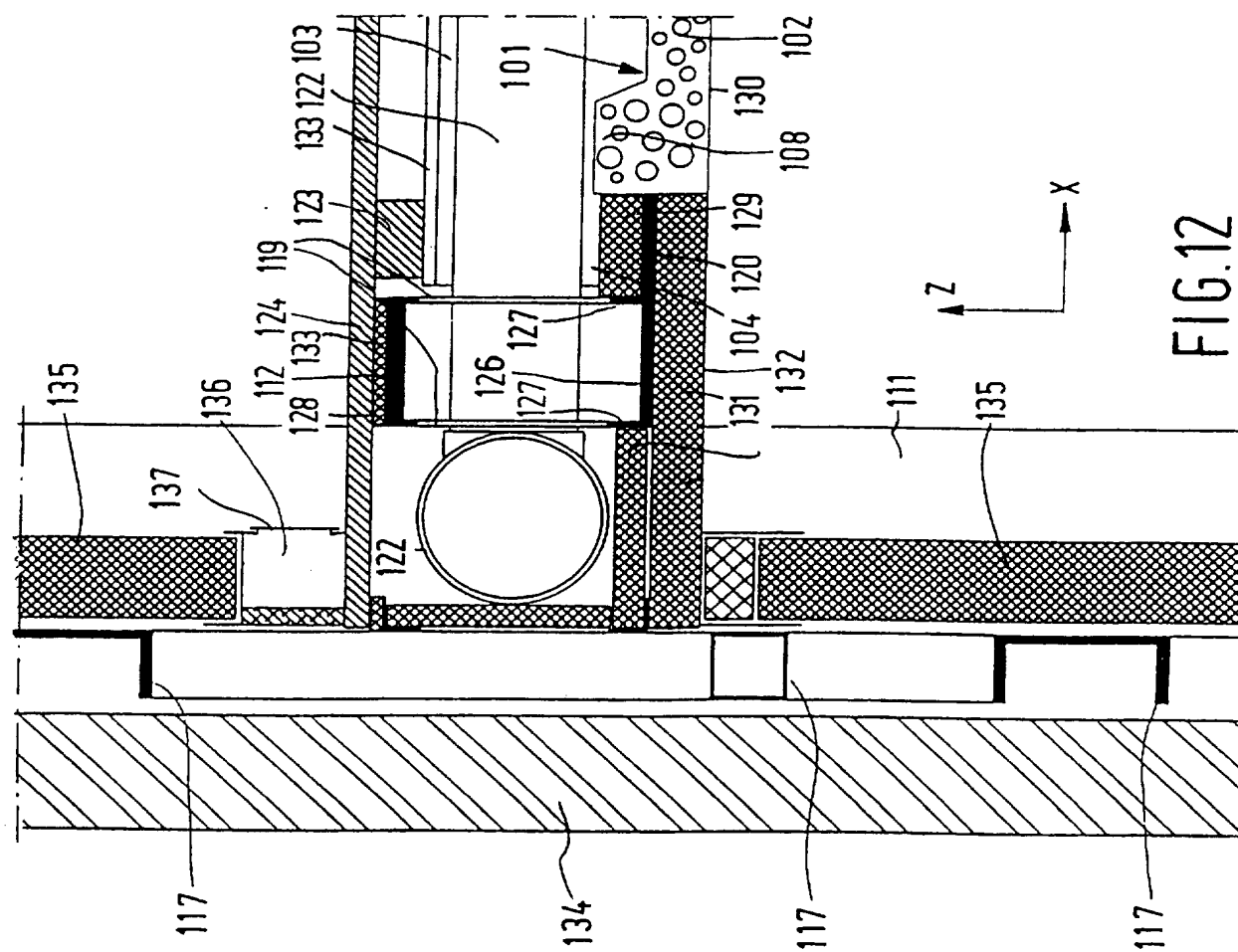


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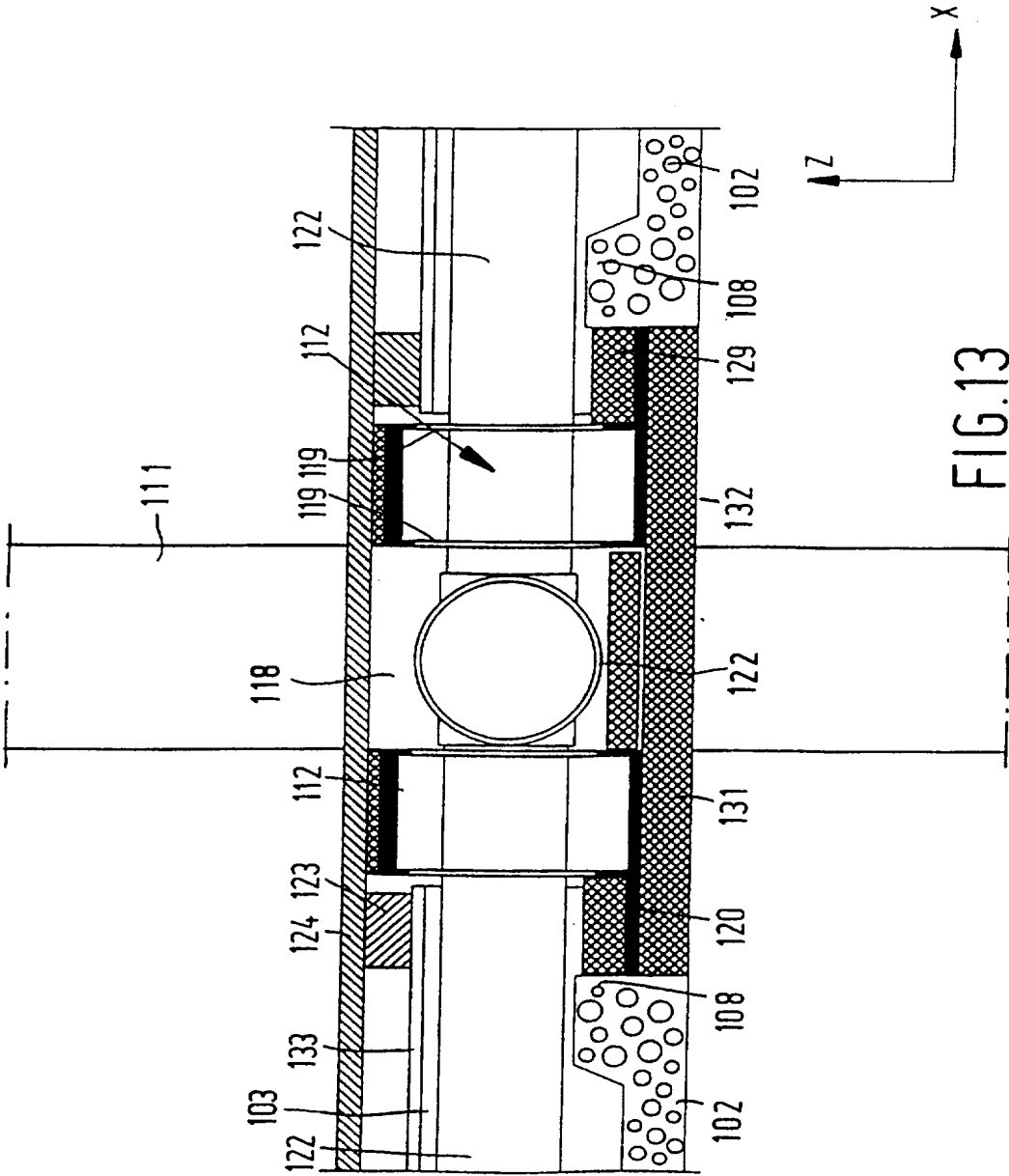


FIG. 13

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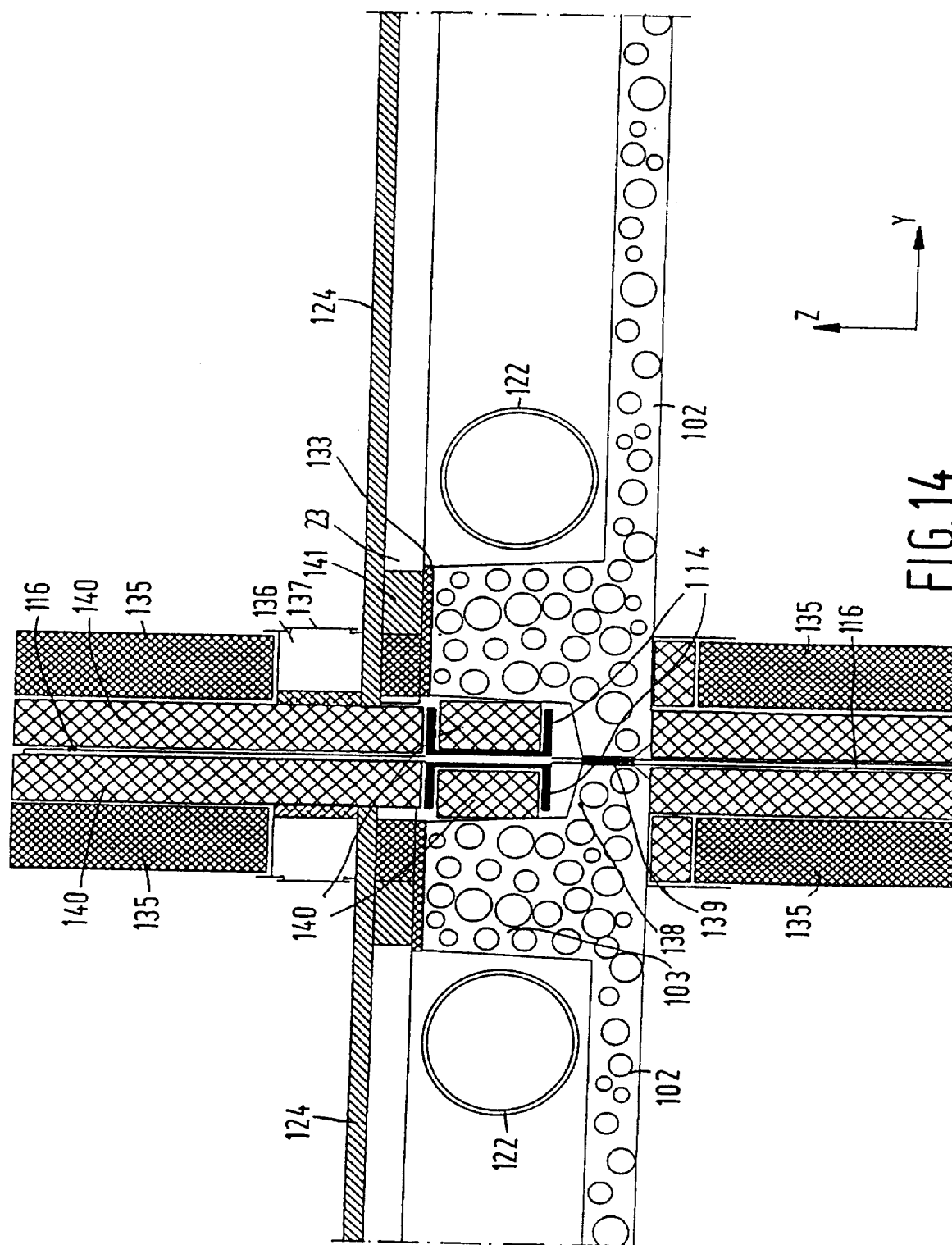
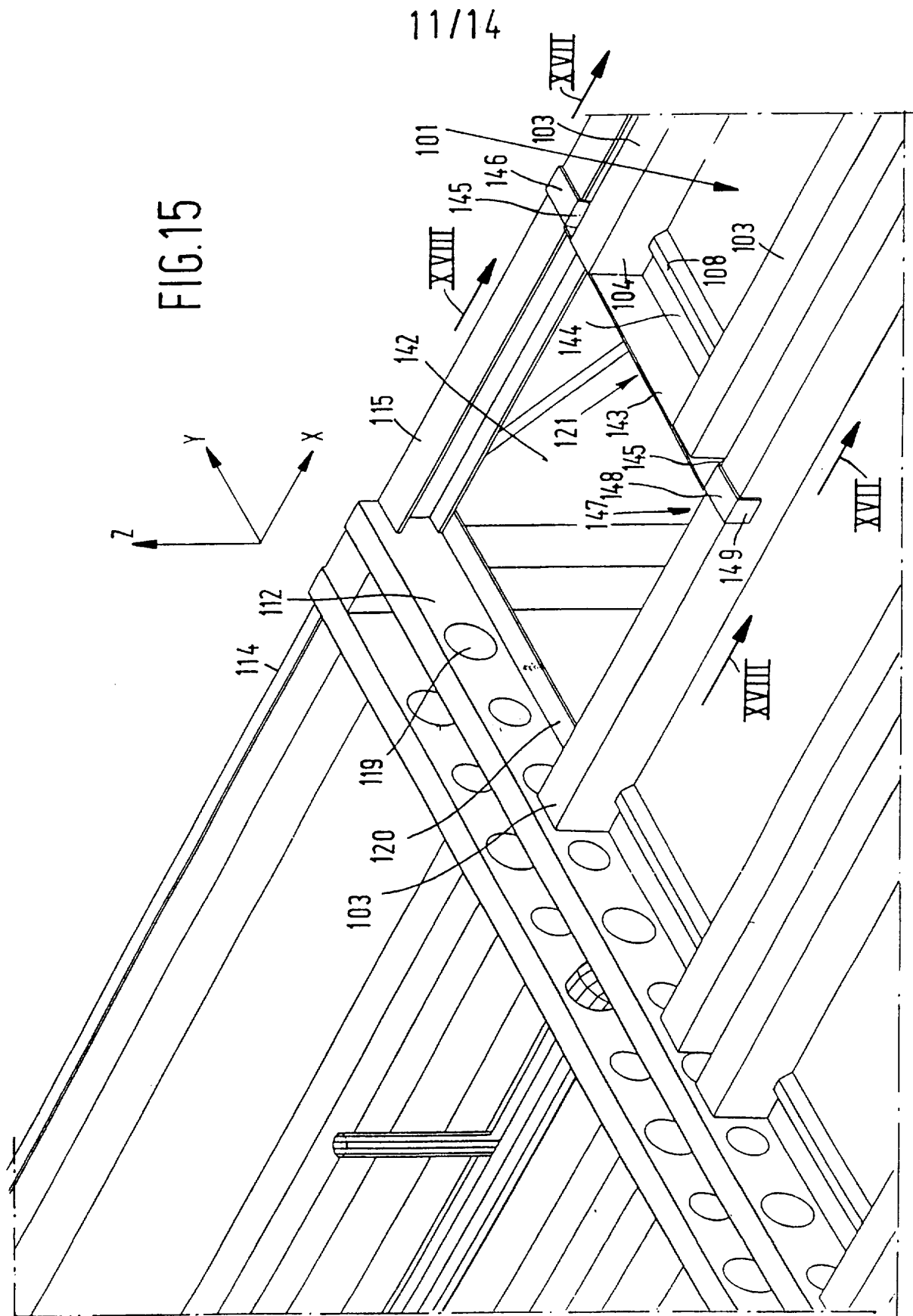
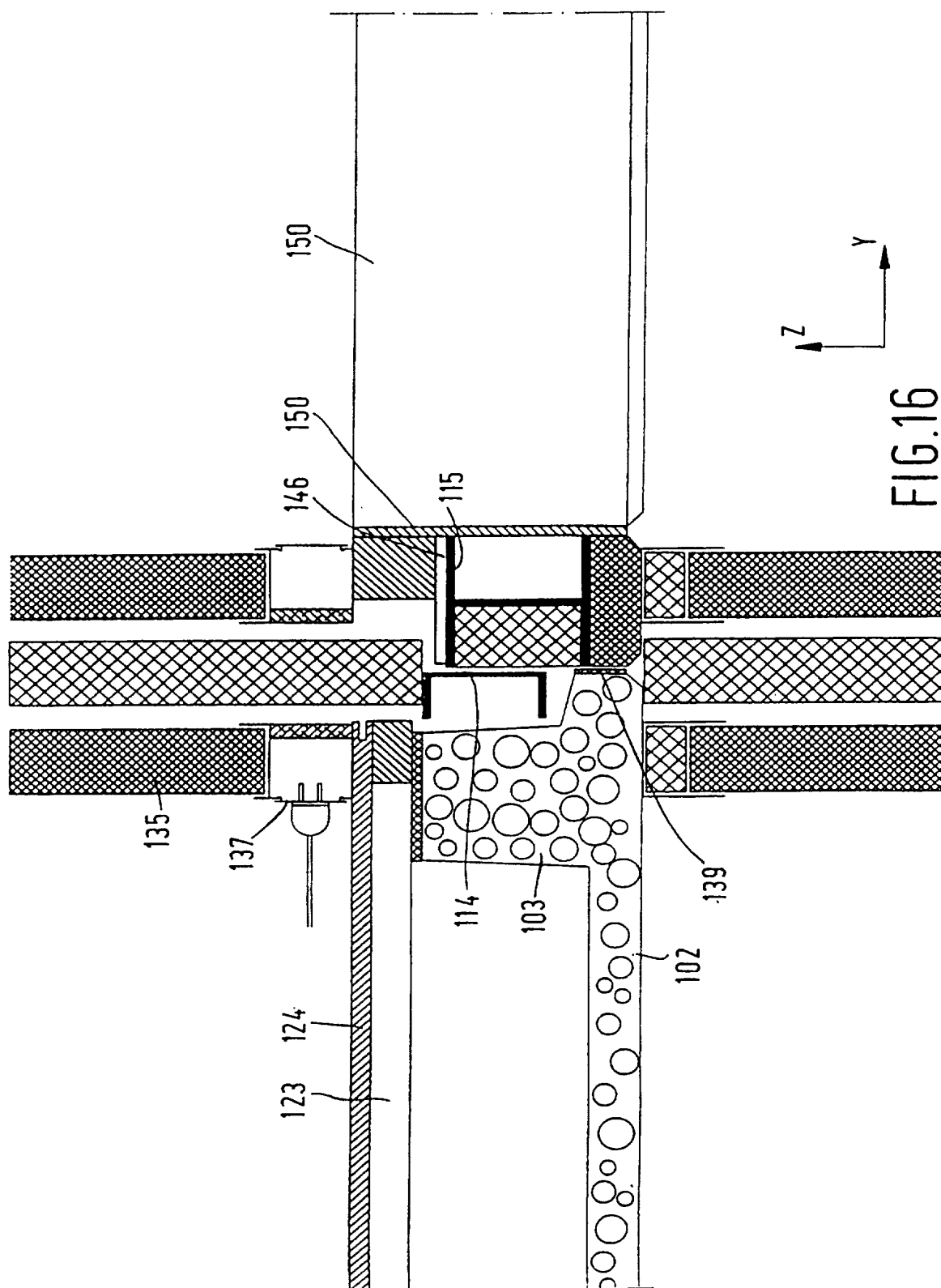


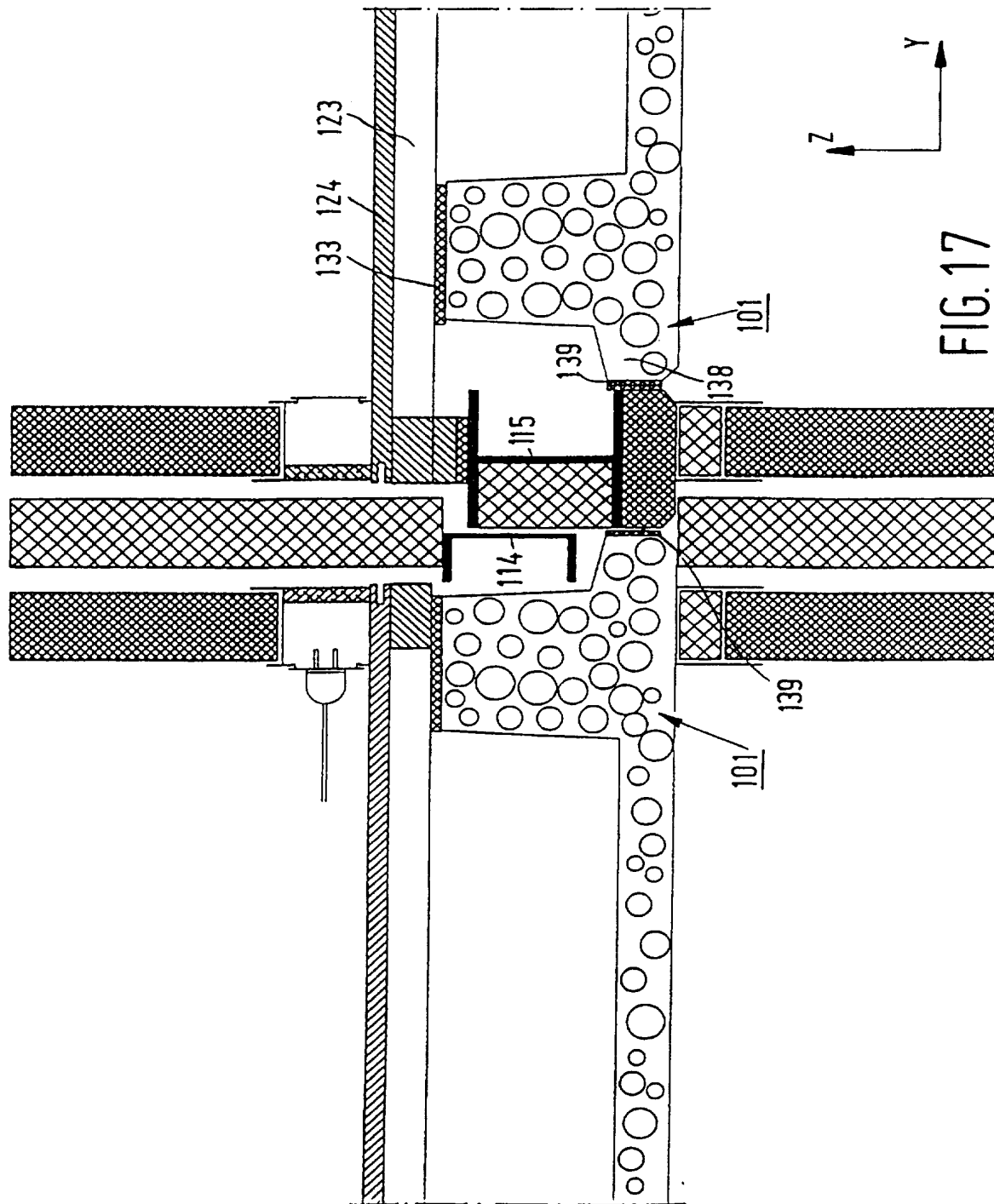
FIG. 14



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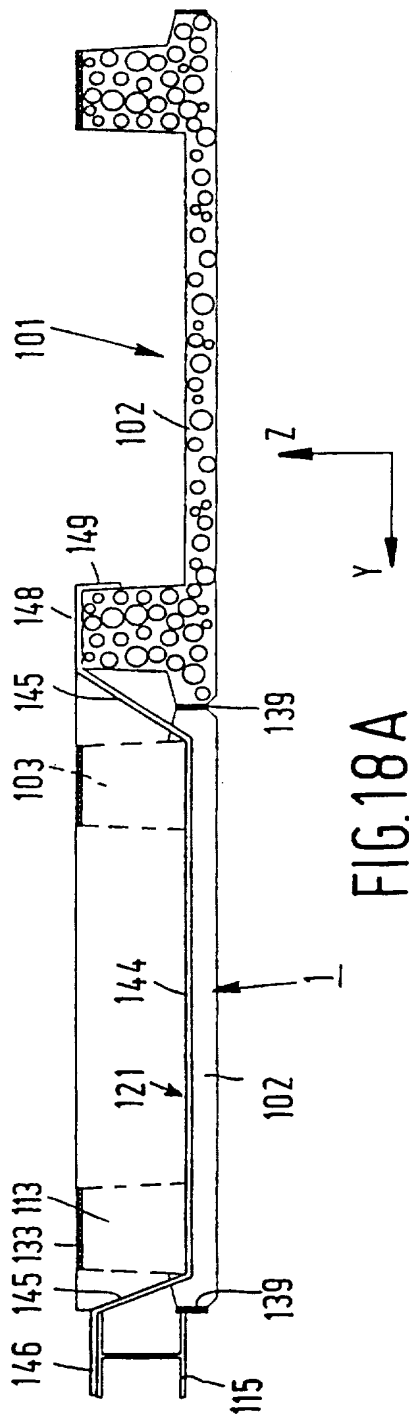


FIG. 18A

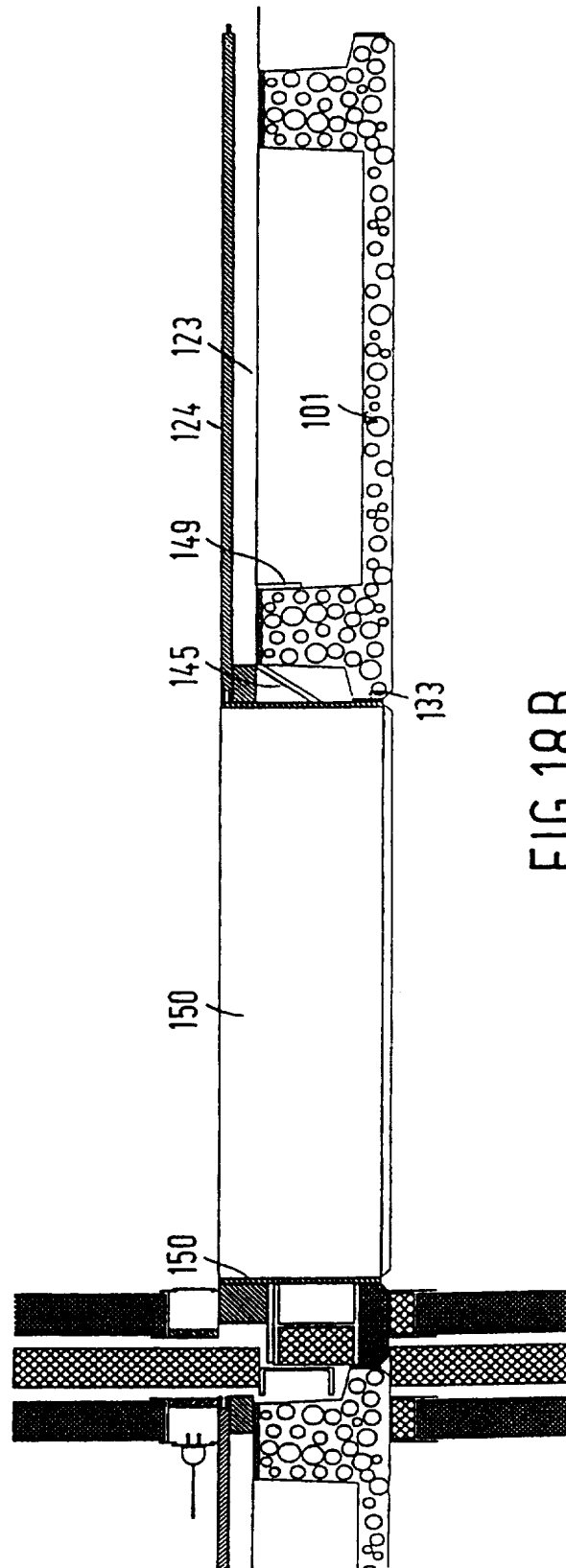


FIG. 18B

INTERNATIONAL SEARCH REPORT

Int. National Application No
PCT/NL 97/00530

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 E04B5/48 E04B5/10 E04B5/02

According to International Patent Classification(IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 E04B E05B E04C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3 546 830 A (JEAN-CHARLES VILLANEAU) 15 December 1970 cited in the application	1-3,8,9, 14-16
A	see column 2, line 46 - column 2, line 58 see column 4, line 22 - column 4, line 31 see figures 1-12 ---	5,6
Y	FR 2 428 714 A (SA AUTOMOBILES CITROEN, AUTOMOBILES PEUGEOT) 11 January 1980	1-3,8,9, 14-16
A	see page 3, line 16 - page 3, line 35 see figures 1-4 ---	5
A	FR 1 554 826 A (CHENEL) 24 January 1969 see figures 1-4 ---	4,10

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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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Date of the actual completion of the international search

26 November 1997

Date of mailing of the international search report

08/12/1997

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Righetti, R

INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 97/00530

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	US 5 289 665 A (HIGGINS) 1 March 1994 see claim 1; figures 13,14 ---	12
A	DE 23 07 756 A (LEHMANN) 22 August 1974 see page 8, paragraph 8 - page 9, paragraph 2 see page 10, paragraph 2 - page 12, paragraph 1 see page 14, paragraph 1 see figures 1-4 ---	7,13
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/NL 97/00530

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FR 1554826 A	24-01-69	NONE	
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		AU 6548394 A	08-08-95
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